

Argos promotion actions (CLS & SAI)**1. Promotion of the existing system (Argos 1 & 2)**

CIS and SAInc participated in the following conferences and exhibitions in the three market segments where Argos is presently used : Science, Fishing monitoring and Sensitive use.

Date	Name	Place	Application
24 May > 5 Jun 2004	Cigognes du pays nantais	Nantes, France	Wildlife
7 Jun > 11 Jun 2004	Posidonia	Athens, Greece	Maritime
14 Jun > 18 Jun 2004	IATTC	Lima, Peru	VMS
29 Jun > 30 Jun 2004	IMB Anti Piracy conference	Kuala Lumpur Malaysia	Maritime
28 Jul > 30 Jul 2004	FAO VMS Workshop (Caribbean)	Trinidad	VMS
3 Aug > 5 Aug 2004	FAO VMS Workshop (Central America)	Panama	VMS
18 Sep > 22 Sep 2004	Wildlife Society Meeting	Calgary, Alberta	Wildlife
28 Sep > 2 Oct 2004	SMM	Hambourg, Germany	Maritime
18 Oct > 27 Oct 2004	DBCP/JTA meetings	Chennai, India	JTA
19 Oct > 21 Oct 2004	4th Ocean Technical Workshop	Newport, RI	Oceanography
25 Oct > 31 Oct 2004	EuroNaval	Paris, France	VMS, Maritime
6 Dec > 10 Dec 2004	NOAA Direct Readout Conference	Miami, FL	Argos
8 Dec > 11 Dec 2004	Maritima	Paris, France	Maritime, VMS
16 jan > 22 jan 2005	Sea Turtle Symposium	Savannah, Georgia	Wildlife
7 Feb > 11 Feb 2005	IMO COMSAR9	London UK	Maritime
21 Feb > 23 Feb 2005	Eurisy symposium on New Space Technologies	Paris France	Maritime
15 Mar > 18 Mar 2005	ECPS 2005	Brest, France	Argos 3
28 Mar > 31 Mar 2005	Users conference	Tarragona, Spain	Argos
5 Apr > 7 Apr 2005	Argos Users & Manufacturers conference	Annapolis, MD USA	Argos

Date	Name	Place	Application
2 Apr > 7 Apr 2005	ECS 2005	La Rochelle, France	Wildlife
14 Apr > 16 Apr 2005	Fisheries Exhibition	Agadir, Morocco	VMS
21 Apr > 22 Apr 2005	VMS Pacific conference	Cairns, Australia	VMS
25 Apr > 27 Apr 2005	NOAA/OCO System Review	Silver Spring, MD	Oceanography
30 May > 3 Jun 2005	IOTC	Mahe, Seychelles	VMS
13 Jun > 16 Jun 2005	Biologging II	St Andrews, Scotland	Wildlife

2. Promotion of the future system (Argos 3)

The Argos III Project includes a new key link between the sensors and the users. This new unit, also called PMT (Platform Message Transceiver), will work as a modem with the acquisition of data and their management to communicate with the satellite constellation. This management will include:

- the transmission of uplink messages using the satellite pass prediction attached with the compatible modulations,
- the reception and processing of the downlink messages (commands, predefines messages, satellite acknowledgement,...).
- the communication with the platform for the acquisition of sensors and the delivery of an acknowledgement when they have been all transmitted and ACK by satellites.

This new tool will give users new performances as soon as the satellite will be declared operational.

Using the feedback from ADEOS II, CLS has decided to run the "PMT Project" with two main targets.

The first one is to get some "**PMT demo units**" available as soon as the first Metop satellite will be declared operational.

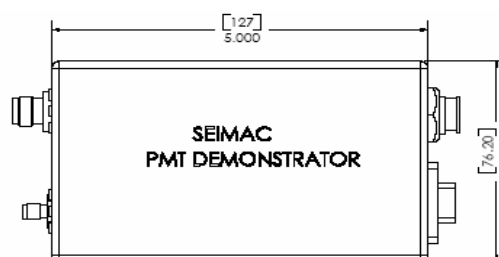
The second one is to work on "**Industrial PMT RF modules**".

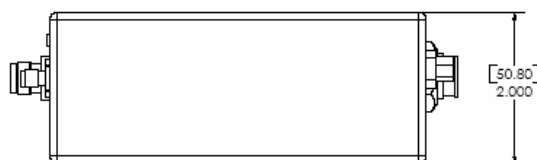
• PMT demo units

The very first PMTs were developed in 2002 / 2003 by Bathy Systems (Boston / USA) in collaboration with Seimac Ltd (Halifax / Canada), a major transmitter manufacturer. These units were working only on a BPSK 400 bits/sec. uplink and a BPSK 200 bits/sec. downlink. They were built around existing modules making the end product rather larger and expensive but fine to run demos. This work, as the collaboration between different manufacturers, gave us the opportunity to order in May 2005 a set of 80 of these "**PMT demo units**" with the implementation of some evolutions to take into account the Argos III new features.

These evolutions concern a new digital transmitter to run the PMT on both BPSK and GMSK modulations. This new transmitter is under development. It will be integrated together with the existing Martec downlink receiver to make these new Argos III PMTs also called PMT A2/HD.

Seimac is planning to deliver a very first prototype unit by late December 2005. A set of 80 units will be available by June 2006. These units will also be reduced in size compared to the Adeos II PMTs to get a "semi-industrial" solution for users. We present below the dimensions of the corresponding product:





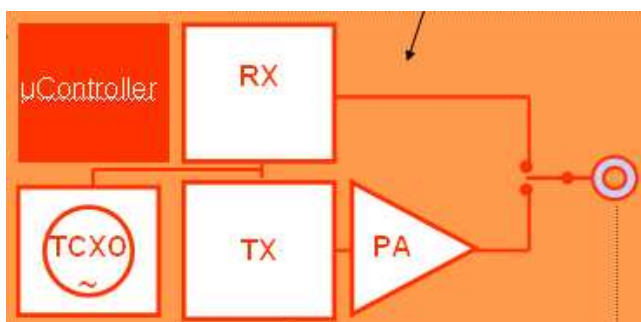
Beside this work done in North America, CLS makes some investigation to select one other provider in Europe for the development as the production of a different set of “**PMT demo units**”. This new source of material should bring on the market in June 2006 other ideas and technical solutions to optimize the product as far as possible for very low volume batches.

• Industrial PMT RF module

Part of the success of the Argos III project will be based on the availability of low cost, low consumption and tiny “**PMT RF modules**”. These modules correspond functionally to the previous PMT demo units but designed “from scratch”. In other words, instead of building a final product with the assembly of existing modules we propose to redesign the complete product to make it simpler on a single “electronic board”. Doing so will certainly reduce the size, the cost, the complexity of the product (less controllers and interfaces) and the consumption.

This work started early in 2005 with some consultant studies on possible technical solutions as an analysis of the volume of the market.

The kernel of the product is clearly identified. It will be made of a receiver, a transmitter, a relay to switch the unique antenna from the Rx to the Tx and a controller to manage the satellite protocol and to support the communication with the outside.



The recommendation made by these consultants is mainly to work with major RF manufacturers already present in the same application fields as Industrial Scientific Medical, Professional Mobile Radio or Cospas/Sarsat Beacons. Doing so, we will get benefit from their knowledge on these technologies and certainly enlarge the production batches since these applications are very similar. We present here after the various main actual RF segments, the volume per OEM, the architecture, the semi conductor solutions, the partitioning and the trends.

Cellular Handsets	>480M / ~6 -1000M top5=80%	Super het, Zero IF Near Zero IF	Custom ASIC ASSP, Chipsets 2-3 chip solution	RF, FEM (Front end Module), Baseband	Partition merges Digital except RF front end LNA / PA
Cellular infrastructure	1.2M / ~200 -400K Top5=70%	Superhet Near Zero IF	Custom ASIC ASSP, Chipsets	RF, FEM (Front end Module), Baseband	Partition merges Digital except RF front end LNA / PA
ISM (Industrial Scientific Medical)	<10M / ~50-500K Top5=45%	Heterodyne Superhet	Some RFICs ASIC's inc µPC Discrete	RF module Integrate controller	Increasing single chip solution. Standard modules.
PMR /MOBITEX (Professional Mobile radio)	<150K/ ~30-50K Top 5=90%	Super het, Zero IF Near Zero IF	Some RFICs ASIC's inc µPC	RF module Integrate controller	Increased single chip solution RF + baseband
Cospas/Sarsat Beacon	120K / ~5 -50K Top5=80%	Heterodyne	RFIC's, Discretes	RF Mod / board + controller PCB Add-on GPS PCB	ASIC for OCXO, RF portion RFIC/Discrete

Conclusions of their studies are focused on the use of standard IC or even discreet solutions produced in large quantities. Solutions based on Asics or FPGA were rejected for the mass production concerned with the volume of the Argos market.

From a financial point of view it has been clearly underlined that the product should be manufactured at a unit cost close to 200€ to keep the final integrated product competitive regarding other existing solutions (Inmarsat, Vistar,...)

Beside that technical conclusion, the Cospas/Sarsat manufacturers seem to be the best candidates for the development and production of these PMT RF modules.

In parallel to this technical approach we have started a market analysis to approach the production volume for these PMT RF modules. This work is about to be finished and will certainly conclude on a yearly basis of 8 to 10 thousands units per year. Using the detailed conclusion of this work will enable CLS to build up a Tender for the selection of the best candidate to develop and produce a large annual volume of PMT RF modules at a very low cost. This tender should be issued by September 2005 with the objective to get a batch of 1000 products available by the end of 2006.